CLAIMS

1. A stochastic pulse generator comprising a variable signal generator operative to generate a variable signal which varies randomly, and a comparator operative to output a binary signal of High or Low depending on which of one input signal and another input signal is larger or smaller than the other, wherein

when the variable signal is inputted as said one input signal to the comparator from the variable signal generator, the comparator stochastically outputs pulses, the number of which corresponds to a magnitude of said another input signal.

2. The stochastic pulse generator according to claim 1, wherein the variable signal generator is operative to generate, as the variable signal, a control random signal statistically having a histogram in terms of its magnitude and a statistical histogram of the pulses is controlled based on a distribution of the histogram of the control random signal.

3. The stochastic pulse generator according to claim 2, wherein said another input signal contains at least a periodic signal as a component thereof.

4. The stochastic pulse generator according to claim 2, wherein the variable signal generator has a storage device and is operative to generate the control random signal by digital/analog conversion of random number digital data having a predetermined histogram stored in the storage

device.

5. The stochastic pulse generator according to claim 4, wherein the random number digital data having the predetermined histogram is obtained by an inverse transformation method or a rejection method.

6. The stochastic pulse generator according to claim 3, wherein: the control random signal contains a frequency component higher than a frequency band of the periodic signal contained in said another input signal; the pulse generator has a low-pass filter for blocking a frequency band higher than the frequency band of the periodic signal; and the pulses outputted from the comparator are inputted to the low-pass filter.

7. The stochastic pulse generator according to claim 1, wherein the variable signal generator is operative to generate a random variable signal having a histogram becoming uniform in at least an infinite time.

8. The stochastic pulse generator according to claim 7, wherein the variable signal is chaos of a tent map.

9. The stochastic pulse generator according to claim 7, wherein the variable signal is chaos of a Bernoulli shift map.

10. The stochastic pulse generator according to claim 7, wherein the variable signal is uniform random numbers.

11. The stochastic pulse generator according to claim 1, wherein the comparator is an analog comparator.

12. The stochastic pulse generator according to claim 1, wherein the comparator is a chopper type CMOS comparator.

13. The stochastic pulse generator according to claim 12, wherein said another input signal is inputted to and held by the chopper type CMOS comparator and then the variable signal is inputted to the chopper type CMOS comparator subsequently.

14. An absolute difference processor comprising first and second stochastic pulse generators each comprising a stochastic pulse generator as recited in claim 1; and an exclusive-OR circuit for outputting an exclusive-OR of an output of the first stochastic pulse generator and an output of the second stochastic pulse generator; wherein

when said another input signal and the variable signal which are inputted to the first stochastic pulse generator are V_{S1} and V_{C1}, respectively, while the output of the first stochastic pulse generator is V_{O1}, and said another input signal and the variable signal which are inputted to the second stochastic pulse generator are V_{S2} and V_{C2}, respectively, while the output of the second stochastic pulse generator is V_{O2}, the variable signals V_{C1} and V_{C2} are the same variable signal:

thereby obtaining an absolute difference between the value of said another input signal V_{S1} and that of said another input signal V_{S2} in the form of a number of stochastic pulses comprising the exclusive-OR.

15. The absolute difference processor according to claim 14, wherein the stochastic pulses comprising the exclusive-OR are generated with a pulse generation probability which lowers with decreasing absolute difference between the value of said another input signal V_{S1} and that of said another input signal V_{S2}.

16. The absolute difference processor according to claim 14, wherein the variable signals V_{C1} and V_{C2} are generated to repeat the same progression.

17. A Manhattan distance processing apparatus comprising a plurality of absolute difference processors as recited in claim 14 which are connected in parallel with the single variable signal generator, wherein

signals corresponding to elements of respective of two vectors each having the elements, a number of which corresponds to the number of the absolute difference processors, are inputted as said another input signal V_{S1} and said another input signal V_{S2} to each of the absolute difference processors,

thereby obtaining a Manhattan distance between the two vectors in the form of number of stochastic pulses.

18. A stochastic pulse generator driving method for a stochastic pulse generator including a comparator operative to output a binary signal of High or Low depending on which of one input signal and another input signal is larger or smaller than the other,

the method comprising inputting a randomly variable signal as

said one input signal to the comparator to cause the comparator to stochastically output pulses, the number of which corresponds to a magnitude of said another input signal.